WHAT IS CLAIMED IS:

1. An electronic device, comprising:

an active region located over a substrate;

an undoped layer located over the active region, the undoped layer having a barrier region including aluminum located thereover; and

a doped upper cladding layer located over the barrier region.

2. The electronic device as recited in Claim 1 wherein the barrier region is a barrier layer or a number of barrier layers located between a plurality of the undoped layers.

3. The electronic device as recited in Claim 2 wherein the number of barrier layers ranges from about 1 to about 8 layers and each of the number of barrier layers has a thickness of about 1 nm.

4. The electronic device as recited in Claim 1 wherein the barrier region includes an barrier layer consisting of aluminum arsenide, aluminum phosphide, indium aluminum arsenide, indium aluminum arsenide phosphide, or indium aluminum gallium arsenide.

5. The electronic device as recited in Claim 4 wherein the

barrier layer comprises between about 5 and about 50 percent aluminum.

6. The electronic device as recited in Claim 1 wherein the barrier region has a thickness of about 1 nm and the undoped layer has a thickness of about 10 nm.

7. The electronic device as recited in Claim 1 wherein the barrier region does not form a p-n junction with the doped upper cladding layer.

8. The electronic device as recited in Claim 1 wherein the doped upper cladding layer is doped with zinc and the barrier region inhibits the diffusion of zinc into the active region.

9. A method of manufacturing an electronic device, including:

forming an active region over a substrate;

forming an undoped layer over the active region, the undoped layer having a barrier region including aluminum formed thereover; and

forming a doped upper cladding layer over the barrier region.

10. The method as recited in Claim 9 wherein the barrier region is a barrier layer or a number of barrier layers located between a plurality of the undoped layers.

11. The method as recited in Claim 10 wherein the number of barrier layers ranges from about 1 to about 8 layers and each of the number of barrier layers has a thickness of about 1 nm.

12. The method as recited in Claim 9 wherein the barrier region includes an aluminum barrier layer consisting of aluminum arsenide, aluminum phosphide, indium aluminum arsenide, indium aluminum arsenide phosphide, or indium aluminum gallium arsenide.

13. The method as recited in Claim 12 wherein the barrier layer comprises between about 5 and about 50 percent aluminum.

14. The method as recited in Claim 9 wherein the barrier region has a thickness of about 1 nm and the undoped layer has a thickness of about 10 nm.

15. The method as recited in Claim 9 wherein the barrier region does not form a p-n junction with the doped upper cladding layer.

16. The method as recited in Claim 9 wherein forming a doped upper cladding layer includes forming a zinc doped upper cladding layer, wherein the barrier region inhibits the diffusion of zinc from the upper cladding layer into the active region.

17. An optical fiber communications system, comprising:

an optical fiber;

a transmitter and a receiver connected by the optical fiber; and

an electronic device, including:

an active region located over a substrate;

an undoped layer located over the active region, the undoped layer having a barrier region including aluminum located thereover; and

a doped upper cladding layer located over the barrier region.

18. The optical fiber communication system recited in Claim 17 wherein the barrier region is a barrier layer or a number of barrier layers located between a plurality of the undoped layers.

19. The optical fiber communication system recited in Claim 17 wherein the transmitter or the receiver includes the electronic device.

20. The optical fiber communication system recited in Claim 17 further including a source or a repeater.